## **RC4 Wireless Extended RDM Functionality**

f/w v2.118.x.x, Rev1.2 26-Jul-2021

Your new RC4 wireless dimmer is programmed with new firmware providing many new and useful RDM (remote device management) features. You can update your older devices as well, using an RC4 CodeLoader cable and free CodeLoader software available for both Mac and PC (find tutorials and step-by-step isntructions in the RC4 support knowledge base).

**Not all RDM controllers are created equal.** The core RDM specification, ANSI E.120-2010, is a basic framework. Extensions introduced in ANSI E1.37-2012 (updated in 2017) provide additional functionality you'll need to make the most of new RC4 firmware. We also make extensive use of "Manufacturer PIDs" which are not supported by all controllers.

**All RC4 functionality has been optimized for the DMXcat RDM controller**, which supports everything you need to configure RC4 devices using your smartphone. This document provides DMXcat screenshots. Other controllers may present information in a different format, since the user-interface is determined by the controller, not by the device being configured.

If you are using an RC4 LumenDim device with a LumenRadio transmitter capable of wireless RDM, like a TX1 or TX2, you can access many RC4 features using SuperNova software for Mac and PC. At the time of this writing, not all RC4 features are fully supported by SuperNova. (Please let LumenRadio know you're waiting for it!) You can also configure your LumenRadio RDM transmitter to work with an external RDM controller, like the DMXcat. This gives you the most complete wireless RDM experience, with access to all RC4 (and other brand) devices that are linked to that transmitter.

Many people prefer to configure devices via wired connection. The miniplug port on every RC4 Series **3 device is a DMX port that fully supports wired DMX and RDM.** Use our miniplug-to-XLR5 adaptor, or make your own (find the pin out in the RC4 support knowledge base).

When connecting by wire, only one DMX data source should be active at a time; the RF data stream should be disabled. Do this by either:

- 1. Unlinking the radio from the transmitter, OR
- 2. Unplugging the wired DMX input to the transmitter, OR
- 3. Turning off the transmitter.

Now your wired RDM controlled is the only DMX data source and it will work as expected. When you are done configuring things, you can re-establish the wireless connection by ensuring that:

- 1. The receiver is linked to the transmitter, AND
- 2. Your DMX controller is connected to the transmitter, powered up, and working, AND
- 3. Your wireless transmitter is powered on and in transmitter mode.

#### Look for additional information, more in-depth descriptions, video tutorials, and firmware files at:

#### http://www.rc4.info

AND https://www.youtube.com/c/RC4Wireless

With RDM set up and working, either wired or wireless, select the device you want to configure by touching its RDM button.



You can change the device name to anything you like.

The most commonly used parameters for the root device:

Loss-of-data timeout time is infinite by default, or you can choose a period from 0.5 – 7.1 seconds.



#### **Profile Personality:**



Personality 1 is the default, for simple DMX control of each individual dimmer.

Personality 2, Crossfade mode, is useful for CCT white control (warm-white/cool-white crossfade). The RC4 Flicker Engine is a powerful way to create many kinds of animated effects.

# \* As of firmware version 2.118.39.8, six-channel dimmers provide enhanced versions of crossfade and HSL personalities. These are outlined in an Addendum at the end of this document.

**Dimmer outputs are presented as RDM Sub Devices.** (On 6-channel devices, dimmers are presented as two sub devices of 3 dimmers each.)



Configure parameters for a particular dimmer by touching the RDM button for the associated Sub Device. You can rename each Sub Device, as well.

For each Sub Device you can configure the **dimmer curve**, **response time** (RC4 Digital Persistence, which emulates the thermal inertia of incandescent filaments), and **PWM frequency** (to avoid banding, flicker, and other artifacts when working with video cameras:



The default PWM frequency, 5 kHz, is appropriate for most camera work. Higher frequencies are helpful for high frame rates (slow-motion capture).

Sub devices also support **context-sensitive help messages**, and **ISL curve-tweak** to optimize the dimming curve of LEDs. The default curve is true ISL (value 255). A value of 0 shifts the curve to true linear. You can optimize dimming for precise control of lumen intensity for any LED product.



Curve-tweak is particularly useful for optimizing CCT crossfade performance. It affects the overall intensity in the middle range. Closer to linear will "lift" the brightness of the crossfade mix.

RC4 dimmers provide various sensors which vary with the particular device model, but most let you see the **supply voltage**, internal **temperature**, and total **current draw** through the dimmers. On small devices, all sensors are part of the root device. On larger sized RC4 devices, separate current sensors are provided for each Sub Device:



To help find and identify remote devices, the RDM Identify mode supports both "quiet" and "loud" options. Touch the light-bulb icon on the DMXcat to engage the Identify function for the root device (all sub devices together), or for any individual sub device.



Numerous RC4 advanced features are supported in the root device, and more will be added in coming firmware updates.



**Power-On blink time and level** sets the dimmers to briefly blink on power-up. This is helpful to indicate that a dimmer that is buried inside a prop or set piece is starting up when power is applied.

**Mute Control** assigns a DMX channel for output muting. Set to zero to disable (the default). The assigned DMX channel, range 1 – 512, will enable/disable all output on the device. This is a non-dim feature; a level above 50% causes all outputs to behave normally, which a level below 50% disables all outputs for an output of zero.

When using the Non-Dim dimmer curve, it is sometimes helpful to set the level where the transition from off to on occurs. You can set both the **Non-Dim Threshold** (default 128, 50%) and the **Non-Dim Hysteresis** (default 5) to ensure that output will not flutter or oscillate if the control channel level hovers around the Threshold level.

**ColorMatch scaling** makes it easy to fine-tune the RGBx white color temperature and calibrate LED light sources to match the color wheel response of other fixtures. This is very powerful when used with unusual combinations of LED component in custom-built props and costumes.

ColorMatch can also be used as a generic range scaler for one or more dimmer outputs. You can use this, for example, to set the top speed of a DC motor being controlled from a dimmer output.

Look for additional information, more in-depth descriptions, video tutorials, and firmware files at: <a href="http://www.rc4.info">http://www.rc4.info</a> AND
<a href="https://www.youtube.com/c/RC4Wireless">https://www.youtube.com/c/RC4Wireless</a>

### RC4 6-Channel Dimmer Addendum

As of firmware version 2.118.39.8, 26-Jul-2021, RC4 six channel dimmers provide two enhanced Personalities optimized for use by the motion picture industry. These Personalities, a.k.a. DMX Profiles, are modeled after popular profiles provided by Arri, KinoFlo, and Astera.

Both of these 6-channel personalities require the same dimmer wiring:

DimA: Red
DimB: Green
DimC: Blue
DimD: Any 4<sup>th</sup> color (optional, usually amber)
DimE: Warm white, i.e. tungsten
DimF: Cool white, i.e. daylight
When using a 5-color RGBTD source, leave DimD unused.

These profiles are optimized for use with LEDs. They do NOT respond to changes in dimmer curve settings. Due to limitations in how RDM works, it is not possible to mask, disable, or change the dimmer curve settings available when specific profiles are selected. Nonetheless, RC4 Motion Picture Enhanced profiles always use inverse-square-law curves optimized for commercial LED lighting; changing the dimmer curve settings for each Subdevice will NOT affect operation of RC4 Motion Picture Enhanced profiles.

Crossfade (i.e. hybrid) color temperatures depend on the LED light sources being used. For best results, use LED panels, tape, and ribbon from reputable manufactures providing high CRI and calibrated color temperatures for warm-white and cool-white. Warm-white emitters are usually somewhere in the range of 2400K - 3000K, while cool white emitters are usually 7000K – 10000K.

The RC4 crossfade algorithm is optimized for linear lumen output level. This means that at the center point, neither warm nor cool white is at maximum intensity. This ensures that magenta/green tint has a consistent influence across the white color temperature range.

RC4 ColorMatch<sup>TM</sup> scaling is supported by RC4 Motion Picture Enhanced profiles, allowing color response to be fine-tuned to match other fixtures being used on set.





This is an 8-channel DMX profile similar to Arri Skypanel Mode 1, KinoFlo True Match v5.0 P25 xfade CCT & RGB 8 bit, and Astera LED profile 94 D CCT GM CRO RGB S:

DMX Channel	Value	Percent	Function
1	0 - 255	0 - 100	Dimmer closed -> open
2	0 - 255	0 - 100	Color Temperature low -> high
3			Green/Magenta Tint:
	0 -10	0-4	Neutral (no tint)
	11-20	5-8	Full magenta tint
	21-119	9-47	Magenta tint 99% - 1%
	120-145	48-57	Neutral (no tint)
	146-244	58-98	Green tint 1% - 99%
	245-255	97-100	Full green tint
4	0 - 255	0 - 100	Crossfade to color
			White (as set above) -> RGBx (as set below)
5	0 - 255	0 - 100	Red intensity
6	0 - 255	0 - 100	Green intensity
7	0 - 255	0 - 100	Blue intensity
8	0 - 255	0 - 100	x intensity (4 <sup>th</sup> color)

RC4 Motion Picture Enhanced CCT + HSLx



This is a 7-channel DMX profile similar to Arri Skypanel Mode 3, and KinoFlo True Match v5.0 P23 xfade CCT & Hue Angle & Saturation (HS) 8 bit:

DMX Channel	Value	Percent	Function
1	0 - 255	0 - 100	Dimmer closed -> open
2	0 - 255	0 - 100	Color Temperature low -> high
3			Green/Magenta Tint:
	0 -10	0-4	Neutral (no tint)
	11-20	5-8	Full magenta tint
	21-119	9-47	Magenta tint 99% - 1%
	120-145	48-57	Neutral (no tint)
	146-244	58-98	Green tint 1% - 99%
	245-255	97-100	Full green tint
4	0 - 255	0 - 100	Crossfade to color
			White (as set above) -> RGBx (as set below)
5	0 - 255	0 - 100	Hue 0 – 360 degree
6	0 - 255	0 - 100	Saturation (white -> deep color)
7	0 - 255	0 - 100	x intensity (4 <sup>th</sup> color)